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EXAMINER

HO, ALLEN C

ART UNIT

PAPER NUMBER

2882

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,415

Applicant(s)

MARIO ET AL.

Examiner

Allen C. Ho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>20022004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Fig. 8 is objected to because: the reference number 106 below the reference number 104 should be deleted.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the filtering material claimed in claim 23 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
- (1) Page 1, line 7, --now U. S. Patent No. 6,661,867 B2-- should be inserted after the filing date.
 - (2) Page 12, line 16, --80-- should be inserted after "end".
- Appropriate correction is required.

Claim Objections

4. Claim 18 is objected to because of the following informalities: There are two step (d)'s and two step (g)'s. Appropriate correction is required.
5. Claim 22 is objected to because of the following informalities:
- Claim 22 recites at least one additional transmission detector that detects high energy x-rays and transmitting them to the processor, the high energy x-rays being combined with the signal from the transmission detector to produce an information stream containing radiographic density and atomic number data. The examiner would like to point out that it is not high-energy x-rays that are transmitted and combined with the signal from the transmission detector.
- Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii *et al.* (U. S. Patent No. 5,260,982).

With regard to claim 1, Fujii *et al.* disclosed a scanning x-ray inspection system, comprising: (a) a conveyor having a belt (22) for moving an object; (b) an x-ray generation device (19) for generating a pencil beam (33) of x-rays repeatedly sweeping along a straight line across the object as it moves through the system, the x-ray generation device being disposed outside the belt; (c) a fast backscatter detector (23) for generating a backscatter signal, the backscatter detector being disposed on the same side of the moving object as the x-ray generation device, outside the belt; (d) a transmission detector (24) for generating a transmission signal, the transmission detector being positioned on the opposite side of the object as the backscatter detector; (e) a processor (29) for processing the backscatter and transmission signals for a display; and (f) a display means (30, 31) for displaying a backscatter image and/or a transmission image.

With regard to claim 5, Fujii *et al.* disclosed a system as recited in claim 1, further comprising a second fast backscatter detector positioned along the straight line and opposite from the fast backscatter detector. The recitation "said system being a tomographic system" has not been given patentable weight. An apparatus must be structurally distinguished from the prior art. Merely stating this is a tomographic system does not structurally distinguish the system from the prior art. MPEP § 2114.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 3, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Wiener-Avnear *et al.* (U. S. Patent No. 5,956,382).

With regard to claims 2, 3, 10, and 11, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the fast backscatter detector and the transmission detector comprise a scintillator having a short persistence phosphor and at least one photon detector.

Wiener-Avnear *et al.* disclosed an x-ray detector comprising Gd₂SiO₅ (column 9, lines 50 - 64) and at least one photon detector (16). Wiener-Avnear *et al.* disclosed that Gd₂SiO₅ is a short persistence phosphor (fast fluorescence rise and decay time) that is suitable for x-ray detection (column 8, lines 33 - 63). Wiener-Avnear *et al.* taught that this x-ray detector produces high-resolution high-quality electronic x-ray image (column 4, lines 44 - 49).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the x-ray detector disclosed by Wiener-Avnear *et al.* as the scatter detector and the transmission detector to obtain high-resolution high-quality x-ray images, since a person would be motivated to identify objects unambiguously.

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10. Claims 2, 4, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Walker (U. S. Patent No. 5,308,986).

With regard to claims 2, 4, 10, and 12, Fujii *et al.* disclosed a system as recited in claim 1.

However, Fujii *et al.* failed to teach that the fast backscatter detector and the transmission detector comprise an organic plastic scintillator and at least one photon detector.

Walker disclosed an x-ray detector that comprises an organic plastic scintillator (column 6, lines 1-26) and at least one photon detector (26) suitable for non-destructive x-ray inspection (column 4, lines 35 - 42). Walker taught that this x-ray detector is characterized by improved image resolution and detection efficiency (column 7, line 61 - column 8, line 9).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the x-ray detector disclosed by Walker as the scatter detector and the transmission detector to obtain high-resolution high-quality x-ray images, since a person would be motivated to identify objects unambiguously.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Grodzins *et al.* (U. S. Patent No. 6,151,381).

With regard to claim 7, Fujii *et al.* disclosed a system as recited in claim 1.

However, Fujii *et al.* failed to teach that the system further comprises a plurality of distal fast backscatter detectors for detecting x-rays scattered from the distal portion of the object, the distal fast backscatter detectors being disposed alongside the fast backscatter detector whereby

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the fast backscatter detector is positioned between the straight line and the distal fast backscatter detectors.

Grodzins *et al.* disclosed a scanning x-ray inspection system comprising a fast backscatter detector (26) for generating a backscatter signal, the backscatter detector being disposed on the same side of the moving object as the x-ray generation device (22); a plurality of distal fast backscatter detectors (28) for detecting x-rays scattered from the distal portion of the object, the distal fast backscatter detectors being disposed alongside the fast backscatter detector whereby the fast backscatter detector is positioned between the straight line and the distal fast backscatter detectors.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide distal backscatter detectors, since a person would be motivated to ascertain the composition and/or content of the object by collecting data on x-rays scattered in different directions.

12. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Kubierschky *et al.* (U. S. Patent No. 4,893,015).

With regard to claims 8 and 9, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the processor is automatically switchable between photon counting and photon integration modes.

Kubierschky *et al.* disclosed a dual mode radiographic measurement method and device that switches automatically between photon counting and photon integration modes. Kubierschky *et al.* taught that the photon integration technique is incapable of measuring very

low levels of x-ray radiation, while the photon counting technique is incapable of measuring very high levels of x-ray radiation (column 1, lines 20-57).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a processor that switches automatically between photon counting and photon integration modes according to the count intensity, since a person would be motivated to design a circuit that would automatically select a suitable mode for counting according to the levels of radiation in order to avoid the pitfalls that are inherent in these modes.

13. Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) in view of Kubierschky *et al.* (U. S. Patent No. 4,893,015).

With regard to claims 18 and 20, Fujii *et al.* disclosed a method for x-ray inspection of an object using transmitted and Compton backscattered radiation, comprising the steps of: (a) providing an x-ray source (19), a conveyor having a belt (22), a fast transmission detector (24), and a fast backscatter detector (23), the x-ray source and the fast backscatter detector being disposed on one side of the belt and the transmission detector being disposed on the other side of the belt; (b) generating a pencil beam (33) of x-rays using the x-ray source; (c) transporting the object on the belt between of the conveyor between the x-ray source and the transmission detector and through the pencil beam; (d) scanning the object with the pencil beam of x-rays; (e) detecting x-ray transmission through the object using the fast transmission detector; (g) detecting x-rays backscattered from the object using the fast backscatter detector; (i) forming a transmission image from the detected transmission x-rays; (j) displaying (31) the transmission image; (k) forming a backscattered image from the detected backscattered x-rays; and (l) displaying (30) the backscattered image.

However, Fujii *et al.* failed to teach the steps of: (f) selecting a detection mode for detecting the transmission x-rays, the mode being at least one of photon integration and photon counting; and (h) selecting a detection mode for detecting the backscattered x-rays, the mode being at least one of photon integration and photon counting.

Kubierschky *et al.* disclosed a dual mode radiographic measurement method and device that switches automatically between photon counting and photon integration modes. Kubierschky *et al.* taught that the photon integration technique is incapable of measuring very low levels of x-ray radiation, while the photon counting technique is incapable of measuring very high levels of x-ray radiation (column 1, lines 20-57).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to select between photon counting and photon integration modes according to the count intensity, since a person would be motivated to select a suitable mode for counting according to the levels of radiation in order to avoid the pitfalls that are inherent in these modes.

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) and Kubierschky *et al.* (U. S. Patent No. 4,893,015) as applied to claim 18 above, and further in view of Annis *et al.* (U. S. Patent No. 5,253,283).

With regard to claim 19, Fujii *et al.* and Kubierschky *et al.* disclosed a system as recited by claim 18.

However, Fujii *et al.* and Kubierschky *et al.* failed to teach the step of combining the backscattered image and the transmission image into a composite image.

Annis *et al.* disclosed a method for x-ray inspection of an object using transmitted and Compton backscattered radiation comprising the steps of combining the backscattered image and the transmission image into a composite image (column 4, lines 1 - 64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combining the backscattered image and the transmission image into a composite image, since a person would be motivated to provide a display format to an operator that is easy to comprehend.

15. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Aune *et al.* (U. S. Patent No. 4,879,752).

With regard to claim 21, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the system automatically adjusts the belt speed.

Aune *et al.* disclosed a scanning x-ray inspection system comprising a conveyor having a belt (12). The speed of the belt is automatically adjusted in accordance with data acquisition and computer processing of the data. This ensures that the inspection line is operated at maximum speed unless an unduly complex operation requires significantly more time than the average is encountered (column 8, lines 44 - 63).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to configure the system to automatically adjust the belt speed depending on different conditions, since a person would be motivated to optimize the processing speed of the inspection line by matching the belt speed with different operating conditions.

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16. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Barnes (U. S. Patent No. 4,626,688) and Alvarez *et al.* (U. S. Patent No. 4,029,963).

With regard to claims 22 and 23, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the system further comprises at least one additional transmission detector overlaying the transmission detector for detecting high energy x-rays, and the processor produces atomic number data.

Barnes disclosed a dual-energy transmission detector comprising a high-energy x-ray transmission detector (24) overlaying a low-energy x-ray transmission detector (22), the detectors are separated by a filtering material (36).

Alvarez *et al.* disclosed a scanning x-ray inspection system that acquires a high-energy x-ray transmission image (75) and a low-energy x-ray transmission image (74). Alvarez *et al.* taught that these images could be processed to form an image representing radiographic density (20) and an image representing atomic number (19).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ at least one additional transmission detector overlaying the transmission detector for detecting high-energy x-rays as disclosed by Barnes, since a person would be motivated to identify an object based on the object's density and atomic number.

17. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above.

With regard to claim 24, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the display means is operative to display each of the backscatter and transmission images in adjacent windows on a single monitor.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to display each of the backscatter and transmission images in adjacent windows on a single monitor, since a person would be motivated to save cost on buying additional monitors.

18. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Lange *et al.* (U. S. Patent No. 5,936,247).

With regard to claim 25, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the signal from the transmission detector is used to correct for attenuation effects in the backscatter image.

Lange *et al.* disclosed that photons emitted from within an object are attenuated to different degrees as they pass through different portions of the object (column 1, line 59 - column 2, line 4), which results in artifacts that obscure images (column 2, lines 5 - 8). Furthermore, Lange *et al.* taught that this attenuation effect could be corrected by using a transmission image, which represents an attenuation map of the object (column 2, lines 9 - 35).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to correct for attenuation effects in the backscatter image by using the signal from the transmission detector, since a person would be motivated to correctly identify a material within the object by obtaining an accurate backscatter image.

19. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) as applied to claim 1 above, and further in view of Anno (U. S. Patent No. 4,651,002).

With regard to claim 26, Fujii *et al.* disclosed a system as recited by claim 1.

However, Fujii *et al.* failed to teach that the signal from the backscatter detector is used to correct for scatter effects in the transmission image.

Anno disclosed a scanning x-ray inspection system that acquires a transmitted x-ray image contaminated with scattered x-rays and a scattered x-ray image. The transmitted x-ray image is corrected for scatter effects by subtracting the scattered image from the transmitted x-ray image (column 7, lines 24-26). Anno taught that scattered x-rays lower the contrast of a transmitted x-ray image (column 1, lines 17 - 24).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to correct for scatter effects in the transmission image by using the signal from the backscatter detector, since a person would be motivated to correctly identify a material within the object by obtaining an accurate transmission image.

20. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii *et al.* (U. S. Patent No. 5,260,982) in view of Wiener-Avnear *et al.* (U. S. Patent No. 5,956,382).

With respect to claim 27, Fujii *et al.* disclosed a scanning x-ray inspection system, comprising: (a) a conveyor having a belt (22) for moving an object; (b) an x-ray generation device (19) for generating a pencil beam (33) of x-rays repeatedly sweeping along a straight line across the object as it moves through the system, the x-ray generation device being disposed outside the belt; (c) a fast backscatter detector (23) for generating a backscatter signal, the

backscatter detector being disposed on the same side of the moving object as the x-ray generation device, outside the belt; (d) a transmission detector (24) for generating a transmission signal, the transmission detector being positioned on the opposite side of the object as the backscatter detector; (e) a processor (29) for processing the backscatter and transmission signals for a display; and (f) a display means (30, 31) for displaying a backscatter image and/or a transmission image.

However, Fujii *et al.* failed to teach that the backscatter detector and the transmission detector comprise a scintillator having a short persistence phosphor and at least one photon detector.

Wiener-Avneer *et al.* disclosed an x-ray detector comprising Gd_2SiO_5 (column 9, lines 50 - 64) and at least one photon detector (16). Wiener-Avneer *et al.* disclosed that Gd_2SiO_5 is a short persistence phosphor (fast fluorescence rise and decay time) that is suitable for x-ray detection (column 8, lines 33 - 63). Wiener-Avneer *et al.* taught that this x-ray detector produces high-resolution high-quality electronic x-ray image (column 4, lines 44 - 49).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the x-ray detector disclosed by Wiener-Avneer *et al.* as the scatter detector and the transmission detector to obtain high-resolution high-quality x-ray images, since a person would be motivated to identify objects unambiguously.

Double Patenting

21. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

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Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

22. Claims 1-27 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of U.S. Patent No. 6,661,867 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other.

With regard to claims 1, 6, and 13, U. S. Patent No. 6,661,867 B2 claims a scanning x-ray inspection system, comprising: (a) a conveyor for moving an object; (b) an x-ray generation device for generating a pencil beam of x-rays repeatedly sweeping along a straight line across the object as it moves through the system, the x-ray generation device being disposed outside the belt; (c) a fast backscatter detector for generating a backscatter signal, the backscatter detector being disposed on the same side of the moving object as the x-ray generation device, outside the conveyor; (d) a transmission detector for generating a transmission signal, the transmission detector being positioned on the opposite side of the object as the backscatter detector; (e) a processor for processing the backscatter and transmission signals for a display; and (f) a display means for displaying a backscatter image and/or a transmission image (claims 1, 12, and 17).

However, although U. S. Patent No. 6,661,867 B2 claims a conveyor, it fails to claim a conveyor belt.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a conveyor belt, since a person would be motivated to scan a plurality of objects sequentially and continuously.

With regard to claims 2-4, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1, wherein the fast backscatter detector comprises a scintillator having a short persistence phosphor and at least one photon detector (claims 2-4 and 13-15).

With regard to claim 5, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1, further comprising a second fast backscatter detector positioned along the straight line and opposite from the fast backscatter detector (claims 5 and 16).

With regard to claim 7, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1, further comprising a plurality of distal fast backscatter detectors (claims 6 and 18).

With regard to claims 8 and 9, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1, wherein the processor is automatically switchable between photon counting and photon integration modes (claims 7, 8, 19, and 20).

With regard to claims 10-12, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1, wherein the transmission detector comprises a scintillator having a short persistent phosphor and at least one photon detector (claims 9-11 and 21-23).

With regard to claim 14, U. S. Patent No. 6,661,867 B2 claims a fast backscatter detector comprising an organic plastic scintillator having an exit end (one end) and a photomultiplier tube mounted at the exit end, and the end being shaped to project light into the photomultiplier tube (claim 24).

With regard to claim 15, U. S. Patent No. 6,661,867 B2 claims a fast backscatter detector as recited in claim 14.

However, U. S. Patent No. 6,661,867 B2 fails to claim that the end is cut at a 45 degree angle.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to cut the end at a 45 degree angle, since a person would be motivated to provide a shaped end that would guide the scintillation light to the photomultiplier tube.

With regard to claim 16, U. S. Patent No. 6,661,867 B2 claims a transmission detector comprising an organic plastic scintillator having the shape of a U and a photomultiplier tube mounted at one end of the U-shape, the one end being shaped to project light into the photomultiplier (claim 25).

With regard to claim 17, U. S. Patent No. 6,661,867 B2 claims a fast backscatter detector as recited in claim 16.

However, U. S. Patent No. 6,661,867 B2 fails to claim that the end is cut at a 45 degree angle.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to cut the end at a 45 degree angle, since a person would be motivated to provide a shaped end that would guide the scintillation light to the photomultiplier tube.

With regard to claims 18 and 20, U. S. Patent No. 6,661,867 B2 claims a method for x-ray inspection of an object using transmitted and Compton backscattered radiation, comprising the steps of: (a)-(k) (claims 1, 7, 8, 12, 19, and 20).

However, although U. S. Patent No. 6,661,867 B2 claims a conveyor, it fails to claim a conveyor belt.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a conveyor belt, since a person would be motivated to scan a plurality of objects sequentially and continuously.

With regard to claim 24, U. S. Patent No. 6,661,867 B2 claims a system as recited in claim 1.

However, U. S. Patent No. 6,661,867 B2 failed to teach that the display means is operative to display each of the backscatter and transmission images in adjacent windows on a single monitor.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to display each of the backscatter and transmission images in adjacent windows on a single monitor, since a person would be motivated to save cost on buying additional monitors.

With regard to claim 27, U. S. Patent No. 6,661,867 B2 claims a scanning x-ray inspection system, comprising: (a) a conveyor for moving an object; (b) an x-ray generation device for generating a pencil beam of x-rays repeatedly sweeping along a straight line across the object as it moves through the system, the x-ray generation device being disposed outside the belt; (c) a fast backscatter detector for generating a backscatter signal, the backscatter detector comprising a scintillator having a short persistent phosphor and at least one photon detector and being disposed on the same side of the moving object as the x-ray generation device, outside the conveyor; (d) a transmission detector for generating a transmission signal, the transmission

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detector comprising a scintillator having a short persistent phosphor and at least one photon detector and being positioned on the opposite side of the object as the backscatter detector; (e) a processor for processing the backscatter and transmission signals for a display; and (f) a display means for displaying a backscatter image and/or a transmission image (claims 1, 2, 9, 12, 13, and 21).

However, although U. S. Patent No. 6,661,867 B2 claims a conveyor, it fails to claim a conveyor belt.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a conveyor belt, since a person would be motivated to scan a plurality of objects sequentially and continuously.

23. Claim 19 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 18 of U.S. Patent No. 6,661,867 B2 in view of Annis *et al.* (U. S. Patent No. 5,253,283). See paragraph 14.

24. Claim 21 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 12, and 17 of U.S. Patent No. 6,661,867 B2 in view of Aune *et al.* (U. S. Patent No. 4,879,752). See paragraph 15.

25. Claims 22 and 23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 12, and 17 of U.S. Patent No. 6,661,867 B2 in view of Barnes (U. S. Patent No. 4,626,688) and Alvarez *et al.* (U. S. Patent No. 4,029,963). See paragraph 16.

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26. Claim 25 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 12, and 17 of U.S. Patent No. 6,661,867 B2 in view of Lange *et al.* (U. S. Patent No. 5,936,247). See paragraph 18.

27. Claim 26 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 12, and 17 of U.S. Patent No. 6,661,867 B2 in view of Anno (U. S. Patent No. 4,651,002). See paragraph 19.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Hoffman *et al.* (U. S. Patent No. 6,879,657 B2) disclosed a computed tomography system comprising a transmission detector and a plurality of backscatter detectors.
- (2) Glockmann *et al.* (U. S. Patent No. 4,884,289) disclosed a plurality of backscatter detectors.
- (3) Nicholas Tsoulfanidis. MEASUREMENTS AND DETECTION OF RADIATION, second edition, p. 218 - 221. Taylor & Francis, Washington, DC., 1995.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Primary Examiner
Art Unit 2882

24 September 2005